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Final report of the Ad Hoc Committee on Faculty Activities, Incentives and Evaluation (The Marto Report)

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DEPARTMENT OF THE NAVY

NAVAL POSTGRADUATE SCHOOL
MONTEREY, CA 93943-5100

IN REPLY REFER TO:

5420
NC4(00)

11 MAY 1987

From: Superintendent Naval Postgraduate School

Subj: FINAL REPORT OF THE AD HOC COMMITTEE ON FACULTY,
ACTIVITIES, INCENTIVES AND EVALUATIONS

Encl: (1) The Marto Committee Report of 20 March 1987 w/Provost
Endorsement

1. I endorse the subject report of the faculty committee. It is a thorough, thoughtful, and well designed document which addresses the special aspects of graduate education designed to meet the national security needs through the education of officers assigned to study at the Naval Postgraduate School. The report reflects the requirements stipulated in the Policy for Naval Postgraduate School by the Secretary of the Navy which includes excellence of teaching, at frontiers of knowledge and aimed at the needs of the Naval Services.

2. The Naval Postgraduate School must stand as a model of higher education to serve the high purpose for which it exists. It must be a beacon. It must teach more effectively than any other institution within the time available for our officers to study and at the same time meet the explosive expansion of knowledge and technology in the world. We must understand and respond in a manner which fully and properly supports developing the insights, intellectual capacity and underlying principles that will serve this nation's defense into the next century. Accomplishment at the Naval Postgraduate School must come from extraordinary teaching by an incentivized, out ahead, faculty whose vigor and passion becomes a national model.

3. Serving this high purpose requires the nicest sense of introspection and evaluation. This report is a major contribution and is approved for wide distribution. The student opinion forms which have prominent reference in the report are an important aspect owing to the maturity and experience of the students. There is great value from these inputs, however, they do not provide the totality of insight needed to create the standards of excellence that our mission demands. Only by complementing candid student input with active faculty and administration involvement in our classrooms, laboratories, and theses will we meet the knowledge and teaching standards which we must achieve.

SUBJ: FINAL REPORT OF THE AD HOC COMMITTEE ON FACULTY,
ACTIVITIES, INCENTIVES AND EVALUATIONS

4. In the interest of continuing the intensity, sound input and initial progress in the area of this report, I task the Provost and Deans to carry out the recommendations of the committee and I will appoint a continuing ad hoc committee to monitor and report to the Superintendent on the effectiveness of the implementing measures. This report is to be made to the Superintendent each academic quarter one month prior to graduation.



R. C. AUSTIN

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Director of Research Administration
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Chairman, Faculty Council
Faculty

PROVOST'S ENDORSEMENT TO MARTO COMMITTEE REPORT

The Report reflects serious and constructive work by the Committee. While reasonable people may disagree on particular issues, the overwhelming thrust of the Report was, in my view, right on the mark. For a variety of reasons it was time to review, assess, propose changes where needed and to reaffirm values and policies where they are determined to be of enduring value. It was most appropriate that this be done by the faculty and the Committee (of faculty) did, in the conduct of its work, involve nearly the entire faculty. The Report recognizes very forthrightly the responsibility of the faculty in these matters.

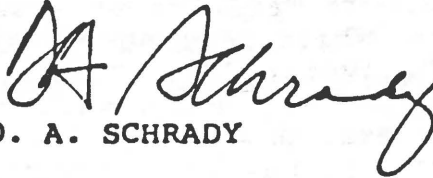
Some of the actions called for in the Report have been initiated. In August 1986, the School wrote to OPNAV regarding the resources necessary to implement the initiatives called for in SECNAVINST 1524.2. Among other things the School requested 10 man years of end strength, salaries, and TDY/PCS monies to support an annual program of faculty experience tours to Navy operational units, laboratories, systems commands, and headquarters of the Navy and Marine Corps. In January 1987 the School submitted a package of adjustments to POM (Budget) 89 and requirements for POM 90. Contained in this package were a set of graduate education excellence initiatives, submitted "over guidance." These initiatives called for increased academic administrative and technical support personnel, significantly increased faculty and faculty budget for course and laboratory development, curriculum coordination and reduction in class sizes, increased entry level faculty salaries, and the establishment of centers of excellence in teaching and research.

An orientation program for new faculty will be initiated this quarter and be run quarterly thereafter. The Faculty Orientation Manual has been revised and is being republished to support this program. The three on-campus seminars address the Navy, the School, the students and elements of effective instruction, and highlights of departmental academic and research programs. Off-campus elements of the orientation program will include a visit to naval activities in San Diego and ship cruises.

Finally the major recommendations of the Report regarding criteria for Pay, Promotion and Tenure have been incorporated into the revision of the Faculty Handbook which will be published this month.

The assessment and appraisal of the Committee and the faculty represented by the Report does not reach fruition with the publication of the Report. While some actions are underway, many actions require leadership and resources to implement. It is my intention that all responsible recommendations in the Report be acted upon.

I have thanked the members of the Committee and its Chairman, Professor Paul Marto, individually and hereby acknowledge to all faculty my appreciation for their really first rate Report.


D. A. SCHRADY

80

NAVAL POSTGRADUATE SCHOOL
Monterey, California

NC4(69Mx)/sa
19 March 87

MEMORANDUM

From: Chairman, Ad Hoc Committee on Faculty Activities,
Incentives and Evaluation
To: Provost

Subj: SUBMISSION OF REVISED FINAL REPORT

Encl: (1) Final Report of the Committee, Dated 20 March 1987

1. Enclosure (1) is the revised version of our committee's Final Report.
2. We have spent a significant amount of time responding to your memorandum of 25 February 1987, and we all agree that the revised version is significantly better than our earlier one.
3. The changes we have made are mostly related to the readability of the report, although a few of the recommendations have changed. We have tried to make the report "tight, scholarly and positive."
4. The entire experience has been very beneficial to each of us. We have learned much about our institution and its mission.
5. Now that we have completed our assigned task, we hope that the administration and the faculty will work closely together to implement our recommendations.


P. J. Marto

Copy to:

Committee Members
Encl.

*Ad Hoc Committee on Faculty Activities, Incentives
and Evaluation.*

FINAL REPORT

of the

Ad Hoc Committee on Faculty
Activities, Incentives and Evaluation

20 March 1987

P. J. Marto, Chairman

D. C. Boger	P. H. Moose
G. H. Bradley	G. E. Schacher
J. N. Eagle	J. Sternberg
R. S. Elster	C. H. Wash

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1. INTRODUCTION

The Naval Postgraduate School is a unique educational institution. It must be able to enhance the combat effectiveness of our Navy, Marine Corps and other armed services through the education of officer students and the active support of operational commands in the Department of the Navy. To accomplish this requires a faculty capable of meeting more demanding standards of performance than the faculty at civilian institutions.

Since the future of this institution rests heavily on the demonstrated excellence of its faculty, it is most important for the faculty periodically to assess their current and future activities in order to maintain a quality graduate education program capable of producing graduates who will be leaders in the 1990s and beyond. In May 1986, the Secretary of the Navy issued SECNAV Instruction 1524.2 [1] concerning the Naval Postgraduate School and its faculty. It stated that NPS faculty evaluation procedures should reflect an equal emphasis on: the quality of teaching, faculty contributions to knowledge, and the active application of that knowledge to the mission of the Navy and Marine Corps. Accordingly, the Provost appointed the Ad Hoc Committee on Faculty Activities, Incentives and Evaluation on 19 August 1986, with a Charter (Appendix A) to study the evaluation system used for pay, promotion and tenure decisions at this institution and to recommend ways to insure that teaching, research and service to the Navy receive equal emphasis in these decisions. The Superintendent requested that the following additional topics receive attention: faculty naval orientation and experience, student research (naval orientation and academic relevance), and the present procedures and norms in pay, promotion and tenure.

During the past seven months, this Committee has made a comprehensive effort to seek faculty opinion regarding the major points of our Charter. We

have attended department meetings of every academic department and group, and have met with members of DRMEC, the Division Deans and the Department Chairmen. In addition, we have solicited faculty input by organizing three faculty open meetings on the following dates: 28 October 1986, 20 January 1987 and 27 January 1987. Subsequent to these meetings, we received numerous written and oral opinions and suggestions for our consideration. That feedback, together with the statistical information we received from the questionnaire administered by the Faculty Council [2], has been of great value to the Committee in responding to many of the issues in its Charter.

This report begins with an overview of the mission and uniqueness of our institution. Current problems are then addressed, together with proposed recommendations, in three subsequent sections: (a) NPS Involvement with the Department of the Navy, (b) Faculty Activities, and (c) Faculty Reward System. These sections are followed by some concluding remarks.

2. NPS MISSION AND UNIQUENESS

The NPS Mission

The Naval Postgraduate School mission is to provide high-quality post-baccalaureate education for the officer corps in selected curricula that have significant impact on the defense of the United States. The Navy has identified those areas of knowledge where the problems being addressed have such profound and far reaching implications for the security of the United States that some members of the officer corps must master the current state of the art in those fields and become active participants in the development of new results. It is not sufficient that these officers just "learn about" these fields or even just master the state of the art at the time of their studies. They must, in addition, develop the intellectual skills that will allow them to continue to grow with their chosen field, the mental abilities that will allow them to accurately predict what is possible with the technology and the leadership skills to translate this insight into effective military use. Although the maintenance of an outstanding faculty with strong Navy knowledge and interests is important for the task of developing new results, it is the intellectual skills of the NPS graduates together with their leadership skills that is critical for developing new technologies for military use. The mission of NPS and the characteristics of the student body present the administration and faculty with a challenge. The response to this challenge has led NPS to develop a unique set of capabilities.

Characteristics of the Students

The students at NPS are highly motivated and, in addition to previous academic achievements, have demonstrated success in their military career. Most of the officer-students are not prepared to immediately begin graduate

studies when they enter NPS. Unlike graduate students at other universities, most have been away from formal studies for from 5 to 15 years. Many are studying in fields that are different from their undergraduate major. Consequently, a designed initial course of study is necessary to quickly prepare them for the pace and intensity of graduate studies and to eliminate any deficiencies in their background or preparation. The NPS curricula are designed to bring the students quickly to the point where they are competitive with graduate students at other universities.

An important part of the NPS experience is to have students work at the same pace and with the same intensity (and unfortunately with the same stresses) as graduate students elsewhere. This is necessary to minimize their time at NPS, to reduce costs, and to get them back quickly into operational jobs. But the most important reason is to have them experience the pace and excitement of science and technology. They must keep up with the best minds in our society and compete with the best minds of our potential adversaries; the experience can not be at 3/4 speed or even 9/10 speed.

There is another special characteristic of the NPS students: they are on a fixed time schedule at NPS. They do not have the luxury of civilian students at other universities to extend their time in school in order to allow additional time to master the classroom work or to complete an ambitious research project.

Necessity for granting degrees

In addition to being awarded primary subspecialty codes (P-codes) in the various curricula, most students also receive a degree (most a Master's degree, a few an Engineer degree, and a few PhDs). The ability of this institution to offer degrees is very important for several reasons. First, NPS is constantly vigilant to keep the content and quality of its degree

programs comparable with other universities. It is important to the officer (who has little or no direct knowledge of graduate programs elsewhere) to know that the degree that is earned will allow him or her to compete as an equal with engineers at a company, scientists at a laboratory, officers across the table at international negotiations, or ultimately officers across the battlefield. Second, the intensity and very long hours of a fast-paced graduate program need to be rewarded with a credential that is recognized throughout the society as a mark of intellectual accomplishment.

Special challenges of operational topics

In addition to education in the standard areas of advanced education, the NPS curricula contain topics related to operational areas within the Navy. Integrating this material into the curricula presents some unique difficulties. There are few books, classroom materials or journals in the operational areas. There is no opportunity for faculty to receive formal education in these areas; the faculty who work in these areas have degrees in standard academic topics; they must develop expertise through self-study and work experiences.

The interdisciplinary operational curricula (Space Ops, ASW, EW, C³) face some additional problems. Each operational curriculum is supported by an interdisciplinary Academic Group composed of faculty with degrees in one of the underlying disciplines. In addition to faculty with expertise in limited aspects of the operational areas, the Groups must have faculty with a broad understanding of the problems sufficient to conduct research, guide thesis students and teach capstone courses. The students must be able to pursue classroom studies and thesis research at the cutting-edge of the technologies in these areas and to continue their studies and independent intellectual growth after they graduate.

Constraints on the School

There are characteristics of the faculty that impact on achieving the School's educational objectives. The faculty receive their formal education in the standard disciplines at a variety of other universities. There are no educational programs at other universities that correspond even approximately to the School's operational curricula. As a single, relatively small institution that does not graduate any students to become university professors, NPS has virtually no influence on the formal education of the faculty that takes place at other universities. In addition, the School must compete with other institutions to recruit faculty. The school's ability to provide comparable pay and working conditions has a significant influence on its success in attracting outstanding people.

Additionally, the faculty are responsible for their own continuing education and professional development. In most areas of expertise, the School has only one or two faculty members. The critical interactions with other people working on similar problems are generally with people external to NPS at Navy activities, research laboratories and other universities. Although the extent and diversity of these personal contacts are such that the School can do little to directly support them, indirect support in such things as a good research library, travel for faculty, and distinguished visitors to campus is very important to maintain and enhance the intellectual vitality and relevance of the faculty. Also the pay, promotion and tenure standards and procedures are critical to retaining and rewarding the faculty who maintain and improve their ability to contribute to the School's mission.

Teaching as a common focus and shared responsibility

A common internal focus of the faculty is that they all teach and further, that they teach the same students. The curricula, the classes, the thesis

support, the out-of-class contact with students is the responsibility of the faculty as a whole. This is an area where the standards and aspirations come from within the School. Every university has a different student body and hence somewhat different objectives, but because of the characteristics discussed above, the student body at NPS presents the faculty with unique challenges and unique rewards. There are some strong external influences such as the availability of books and classroom material, standard curricula, and accreditation committees, but ultimately, each institution directly (or indirectly by default) establishes the standards of achievement and the expectations of excellence for its own programs. In this regard, it is clear that each member of the faculty must continue to strive personally for excellence and to expect the same of our students. Further, the faculty share responsibility to insure that these high ideals are achieved.

The faculty provide the students with a window on the outside world of universities, scholarship and research. Most of the junior officers have not had jobs where they have worked with civilians who have advanced education. As they advance in their careers, they will have increased opportunities to work with people with advanced education who work for contractors, in research laboratories and in universities. NPS is a controlled environment where the students can gain experience while they work with faculty and fellow students on challenging topics. The faculty should set a professional example for them to emulate as they advance in their careers.

The Research Process in a Graduate School

A major objective of all formal education is for the student to gain the ability to learn independently of the teacher so that learning can be sustained throughout the student's life. At the graduate level, an additional objective is introduced: to develop in the student the ability to study, to

analyze and, eventually, to create in his or her field of study. The result of the creative process differs from field to field; it can be a clearer understanding of a natural phenomenon, a design of a device, an interpretation of an historical event, or a theory of the social, economic or political consequences of policy actions. In all cases, this represents research in the field and in a graduate school the mastery of the research process transcends and dominates the learning of facts.

The role of the professor is critical because the process of research is shown by example. The student sees the way the professor deals with data, with ideas, with experiments and with problems. The student can learn the knowledge of the field on his own or with a teacher, but it is only from a professor actively engaged in research that the student can see the intellectual skills needed to study and analyze the field and to create new knowledge. The mastery of these skills requires years of concentrated effort by the faculty; in graduate school the student initially works with the professors to gain knowledge and to read and study the research efforts of others. The thesis is a major opportunity to participate in research under the supervision of a researcher with experience and expertise in the area.

The faculty of a graduate school must be actively engaged in research. Even in the classroom, it is the researcher's perspective not the teacher's knowledge that is most important. The professor's discussion of books, papers, ideas of other researchers and views expressed by the students shows the results of the personal analysis of the materials of the subject. In thesis supervision, it is the process of approaching problems, studying alternatives, and analyzing results that is the main contribution of the researcher to the student colleague.

Shared vision

The policies, procedures, and expectations form a shared vision of the institution held by the School's faculty and administrators. Although largely intangible, this shared vision of the educational programs is perhaps the single most important element of an academic institution. This shared sense of responsibility to students, dedication to the defense of our country, and commitment to excellence fuse the diverse elements of the School together into a cohesive unit. This shared sense of responsibility is the institutional equivalent of character in an individual. For an individual, character is not just the sum of the disparate actions of one's life. So with an institution, the shared sense of responsibility transcends the institution's policies and procedures.

In the education of the NPS officer-students, there is no substitute for excellence. The officer who represents the Navy's expertise in these technologies must work at the level of the best technical minds in our companies, research laboratories, and universities (and in the plants, labs, and universities of our potential adversaries). Because there is no second place in a jet fighter encounter, no award for the second most quiet submarine, and no security in a strategic defense that almost works, NPS must be the best.

3. NPS INVOLVEMENT WITH THE DEPARTMENT OF THE NAVY

Background

The Naval Postgraduate School contributes to the Department of the Navy by providing post-baccalaureate degree and non-degree programs in a variety of sub-specialty areas not available through other educational institutions. Additionally, this institution supports the Department of the Navy through continuing programs of high-level naval and maritime research and through the maintenance of an expert faculty capable of working in, or as advisors to, operational commands, laboratories, systems commands, and headquarters activities of the Navy and Marine Corps.

Research and teaching at NPS should, to the extent it is practical, focus on and reflect the context and concerns of the DoN. Faculty at NPS have a more difficult task than do faculty at other institutions because NPS faculty members must be experts in their disciplines and be very knowledgeable about the DoN. The faculty selection and reward systems at NPS must therefore support the development of a faculty having both academic and naval expertise.

SECNAV Instruction 1524.2 specifies that the NPS faculty evaluation system for pay, promotion and tenure should reflect equal emphasis on: the quality of teaching, faculty contributions to knowledge and the active application of that knowledge to the mission of the Navy and the Marine Corps. As discussed later in this report, the Committee believes that the most effective way to satisfy this direction is for the faculty to meet two criteria in their professional activities: (a) internal contributions in the form of teaching, thesis supervising and service to NPS, and (b) external contributions in the professional community, DoN/DoD, or both. Furthermore, the evaluation of

these contributions must be based on high standards of performance. How this will be done will be discussed later.

Three important external contributions are:

1. Professional contributions to knowledge
 - (a) publications in refereed journals
 - (b) technical reports (classified or unclassified) and other non-refereed written work
2. Membership on DoN/DoD/Professional Society committees, panels, review groups, etc.
3. Consulting for Navy/Joint staffs, laboratories, systems commands, and operational commands.

The scope of activities across all departments at NPS is broad, but the common requirement for a faculty member is that he/she make new contributions to his/her professional field. These contributions may be variously described as scholarly research, academic research, basic research, applied research, new solutions to existing problems, design innovations, technique development, etc. In this report, for simplicity, we will use the single term "research" to represent any of these types of activities.

Problems

What activities do the NPS faculty perceive are rewarded in the pay, promotion, and tenure (PPT) process? The results of the recent Faculty Council survey of the faculty [2] indicate that 93% of the nearly 130 respondents think that publications and research are weighted to a considerable or a very great degree in the PPT process. In stark contrast, only 17% of the respondents think contributions to the mission of the Navy and Marine Corps are weighted to a considerable or very great degree in the PPT process. Only 15% of the respondents think involvement in operational curricula is rewarded to a considerable or great degree. Additionally, only

29% of the respondents think research in areas of current operational concerns is encouraged and supported to a considerable or very great degree. Finally, only about 32% of the respondents think consulting with DoN organizations is encouraged and supported to a considerable or very great degree. So, while SECNAV Instruction 1524.2 states, "Faculty at the NPS shall be fully competent in their areas of academic expertise, and they shall also be able to apply their expertise in support of the naval services," the respondents to the Faculty Council survey indicate that a distinct minority of them think involvement with the Department of the Navy is rewarded to a considerable or very great degree by NPS. As a matter of fact, the respondents' answers suggest that they think refereed publications are necessary and sufficient for success in the NPS PPT process.

The Committee met with individual departments and groups of faculty. Provided below are some representative comments gathered during our meetings.

"Profs don't know operational context of students,"
interview with faculty member

"Faculty avoid involvement with operational curricula and general student background because it is not rewarded,"
interview with faculty member

"Mechanisms for faculty to interact with rest of Navy are definitely needed,"
faculty open meeting, 28 Oct 86

"Knowledge of DoN takes time to develop in faculty,"
interview with faculty member

"There is no conflict between good quality research and contribution to DoN. MIT, for example, does much applied work yet it is a well-regarded university. Quality for research rests on the individual. DoD and DoN are very big. There is interest in every kind of research. It is just a matter of finding the people who are interested in your work. DoN interest will follow high quality research. Don't need to compromise standards or change your research interests to find people within DoN to sponsor your work. You should be interested in DoN and in the things that your students do."

interview with CS Dept & C³ Group Chair

"Applied work is harder than theoretical because it requires experience."

interview with ECE, Oceanography & Math Depts

To implement the new SEQVAV Instruction, "what counts" in the PPT system must be broadened to recognize a wide variety of activities, and the faculty must believe that active involvement with DoN and excellence in teaching are valued as much as are traditional academic publications.

There is a need to emphasize DoN relevance in instruction. Students in all disciplines want and need DoN/DoD examples to help them in relating theory to its current and potential applications. There is also a paucity of resources devoted to instruction. Making courses more relevant requires much more instructor time than using standard, off-the-shelf materials designed for use at non-Navy graduate institutions. A vibrant program of DoN-relevant guest speakers for a curriculum or department also requires resources.

In disciplines where DoN/DoD research activity is limited, other aspects of graduate instruction suffer. DoN/DoD research provides relevant thesis problems and data sets, and the research activity of faculty on these problems is critical for relevant sponsor-directed and application courses where traditional theory is applied. All disciplines need a spectrum of research activity to ensure a broad base of excellence at NPS.

The NPS faculty represent an enormous pool of consulting expertise available to DoN. The Committee believes that the faculty and NPS gain as much from such service as does the rest of DoN. We believe consulting with DoN translates into better research and teaching. Additionally, such consulting is one of the best ways of advertising NPS. Consulting-type relationships between faculty and DoN need to be facilitated and rewarded by NPS. The recent Faculty Council survey of the faculty revealed that only 32% of the respondents thought that consulting with Navy organizations was

encouraged and supported by NPS to a considerable or very great degree. Clearly, perceptions (and reality) concerning the value of faculty consulting with the rest of DoN need to be changed.

There is a need for an on-going program of experience tours with Navy and Marine Corps activities. SECNAV Instruction 1524.2 states that there shall be continuing, high-level interaction between NPS faculty and DoN organizations. Additionally, it states that DoN organizations shall cooperate with NPS to provide experience tours in their organizations for NPS faculty. These experience tours can increase the effectiveness of both instruction and research. Instruction will be improved because of the ready availability of relevant examples of DoN activities. Research will become more useful to DoN since the researcher is exposed to actual DoN problems being worked by the organization which is visited.

Recommendations

1. NPS should establish a mandatory program of faculty orientation and information on DoN. Familiarization tours, such as ship and base visits, are very useful, but the faculty need some initial, basic information on DoN before they can usefully profit from such tours. This basic information can be provided by the Superintendent's lecture series and by the courses in strategy, warfare, organization, and history called for in SECNAV Instruction 1524.2. Although these familiarization tours may require rescheduling of classes by participating faculty, this should be recognized as a minor problem by department chairmen, deans, etc. Once beyond ship visits and the like, DoN information tends to be specific to individual departments, curricula, disciplines, and sponsors. Hence, the best mechanism to initiate action from NPS may be for academic associates or department chairmen to lead the interaction by inviting to Monterey important leaders to begin the process. Return visits by NPS faculty, however, must be supported by NPS resources. The information exchange provided by this process will make teaching and research both more relevant to DoN and more effective for the students.
2. NPS should make a place within the permanent faculty for non-traditional and DoN-oriented individuals. The type of individuals envisioned here are those people, regardless of background, who are making significant contributions to a body of research which intersects the interests of DoN as well as NPS. These individuals, perhaps former military officers or senior executives, or those who

have unique experience in a Navy Laboratory or with a DoN contractor, can offer much to NPS involvement with DoN. Prior military experience should be looked upon as a plus in hiring decisions.

3. NPS should actively recruit visitors from DoN/DoD organizations and should actively support faculty leaves to these organizations. Types (and examples) of such organizations are Laboratories (MMC China Lake), systems commands (NAVAIR), and federal contract research centers (GIA, Rand). Visiting teaching faculty with detailed experience in relevant fields can be used in numerous courses. In earlier courses, they can help students to see how the general concepts introduced in those courses are applied to actual DoN/DoD problems. In later courses, they can show students the details of ongoing research areas. In addition to making courses more relevant for students, these efforts can facilitate contacts between NPS faculty and DoN activities. Visiting research faculty may be used in two ways. They may be used to augment NPS permanent faculty in ongoing, well-defined research areas, or they may be used to explore research areas in which NPS may desire to evaluate the potential of beginning a long-term program. The interaction between NPS faculty returning from leaves and visitors from DoN activities can create a dynamic environment in which Navy phenomena are explored at all levels. It should be noted that, although department chairmen and academic associates can facilitate faculty exchanges, administrative support as well as resources is required. Support mechanisms are needed because, currently, such arrangements are left to the initiative of individual faculty members. Additionally, the burden of financing these exchanges cannot always fall on the organizations receiving NPS faculty or sending personnel to NPS, as it has under current arrangements.
4. NPS should establish a faculty travel and assignment office that can assist faculty in travel plans to facilitate faculty travel and experience tours. NPS must facilitate faculty travel and experience tours. A travel office could provide a tremendous incentive to the faculty. The quality of leadership and staffing in this office will be crucial. The office should err in the direction of doing too much for the professor, being too nurturing, too thorough, etc. The office must help the NPS professor who is out of town to take care of NPS's end of his/her payroll and travel business. Given the exhortations of SECNAV Instruction 1524.2, this office should be seen to be as important as the research administration office, and staffed accordingly.

The faculty travel and assignment office should also be able to help the professor with at least advice concerning his/her living and other arrangements at the location of a detail, e.g., Norfolk or Pearl Harbor. Some will think this too paternalistic; those who have been on such details will not. We must minimize the vicissitudes of travel and assignments away from home.

The current system of PSD offices in the Navy should be taken as a given, at least for the near term. The NPS faculty travel office will need to do much of its business through the PSD. However, whereas PSD appears to represent itself as an adversary to the traveler, the faculty travel office must treat the professor as its responsibility

and as its cherished customer. At a minimum, the NPS faculty member, particularly one who is on assignment away from Monterey, needs an advocate in Monterey who can deal with pay problems, PSD, the Comptroller's office, etc. The advocates in the travel and assignment office can act in assistance to department chairmen or other administrators who try to help faculty. Personnel in the faculty travel and assignment office, however, will in short order have greater experience with JTR and relevant parts of "the system" than will professors, department chairmen or other administrators. Such an office will also be knowledgeable in the most economical and least time-consuming travel arrangements, thereby saving not only government funds but also faculty travel time. This office would also educate faculty on the latest and most important travel regulations pertaining to their particular circumstances.

Having taken the organizational steps to support faculty travel and assignments, NPS must work to assist faculty in finding funding and locations for experience tours and other sorts of assignments. Proposals for research funding should, when appropriate, request funds for faculty travel and details to DoN operational commands, headquarters, etc.

5. Aggressive use should be made of the NPS alumni network by administration, chairmen and faculty. Contact with alumni is an important key to DoN support. The more successful curricula maintain an active dialogue between NPS (faculty and chairman) and their graduates. This feedback provides DoN research opportunities and valuable DoN examples for instruction and uncovers problem areas within the curricula. Methods to utilize alumni include tracking graduates through future assignments, using newsletters to alumni for curricula feedback, and using polls for assessing strong and weak instructional areas. This activity might be focussed through an NPS Alumni office.
6. Research involvement with DoN should be strengthened in NPS disciplines where it is limited. Each department should have vigorous research activity directed toward DoN needs. Methods to enhance DoN research include:
 - (1) Recruitment of new faculty with DoN interests and concerns.
 - (2) Priority funding from the Research Council for quality proposals directed toward DoN problems for both new faculty and current faculty who wish to modify their research thrusts.
 - (3) Organization of more research groups in applied areas. An excellent example of such a successful group is the Environmental Physics Group within the Departments of Physics and Meteorology. The school should foster more of these groups to achieve excellence in DoN research in critical problem areas.

Concluding Comments

SECNAV Instruction 1524.2 directs NPS faculty members to be involved actively with DoN. This requirement must be kept in mind as new faculty are

hired. In addition, the PPT system must reward active involvement through consulting, advising, and working in DoN headquarters, operational commands, etc. Finally, NPS's finances must be robust and flexible enough to foster the desired faculty activities.

It is important to note that in many departments, the deep involvement with DoN called for by SECNAV Instruction 1524.2 already exists. Many faculty have a continuous and strong involvement with DoN through research projects, committee and consulting service. The faculty is proud of its past contributions to DoN. The recommendations of this report will hopefully further strengthen DoN service, one of the unique aspects of a vital NPS.

4. FACULTY ACTIVITIES

Background

Faculty activities are usually grouped into three traditional categories: teaching, research or other creative activity, and service. In the Quality of Engineering Education Project [3], sponsored by the American Society for Engineering Education, the Task Force report on Preparation for the Teaching of Engineering notes "that different educational institutions will differ in their relative emphasis on these activities, but that teaching is a special kind of function that distinguishes a university or college from, say, a research institute. A frequently heard criticism of universities is that they neglect teaching in favor of research. The Task Force emphasizes that teaching is a primary function of a university or college, and that effective teaching should be an essential criterion for appointment or advancement".

Instruction of students is fundamental to the mission of NPS. The relevance and currency of the courses, the student thesis projects, and the academic standards maintained for judging the level of the students' work are the individual and collective responsibility of the faculty. Because we are a graduate institution, it is essential that we also maintain a vigorous research program. It is equally essential that since we serve DoN, that faculty expertise and creative activity be utilized to support DoN wherever and whenever possible.

We believe the internal focus of a faculty member's activities at NPS must be devoted to the education of our students. Our profession is first and foremost higher education. We are the principal actors in this process at NPS, a process which includes developing course material and lectures, testing and developing new techniques for instruction, searching for new books, and

designing problems, examinations, essay topics, and class projects. It includes motivating students to learn things through classroom presentations and office consultations. The faculty play an especially significant role in helping a student select a thesis topic and in guiding the student through his or her research. Faculty also have the front line responsibility for maintaining high academic standards appropriate to their individual academic fields.

The students at NPS present a unique challenge to the faculty. They are dedicated, hardworking, and honest. Cheating, skipping class, and not completing assignments are infrequent problems at NPS. On the other hand, the academic entrance requirements to NPS are lower than at other graduate schools, since many students come here to pursue graduate work in a field other than that in which they hold their baccalaureate degree.

The Ph.D. program at NPS, though deemed excellent in quality, is very small in numbers. Some departments have no Ph.D. students. Many graduate fewer than one per year. Therefore, the instructional program at NPS, as far as most faculty are concerned, is at the Master's level. This is a significant factor both when selecting classroom material and thesis topics. Considering the nature of our students and their educational goal of preparing for future Navy assignments, we believe that a wide variety of creative activities is appropriate for our faculty. This view is supported by the ASEE Task Force report [3].

Problems

Some problems either exist or are perceived to exist by the faculty that could interfere with the continued maintenance of a quality instructional program at NPS. The primary source of these problems stems from the belief that contributions to the instructional program of the school above a "threshold level" are not rewarded:

"For some time, I have sensed among many of my colleagues a perception that, so long as one did not do a poor job of teaching, quality of teaching did not really count. Maybe this is acceptable, if the threshold is sufficiently high. Certainly, preparation of an outstanding lecture does take time and could cut into time available for other duties, such as research"

faculty member's written comment

Most faculty at NPS deem themselves to be good teachers. However, being a good teacher and contributing to the improvement of the instructional program are two different things. It is believed that extra efforts expended in making courses more relevant with DoN examples, in exploring new and better books, in trying out new teaching methods, in tutoring marginal or struggling students, in guiding and encouraging the outstanding students, in coordinating courses in the curriculum so that they flow smoothly and build logically on previous work, in second reading of theses, in advising students in theses of a student's interest not related to the faculty member's research, and to some extent in advising students in Master's level work are all activities that lie above the "threshold". Furthermore, there is a general perception among the faculty that work in the operational areas, as compared with work in the traditional disciplines, will not receive adequate weight in promotion and tenure decisions.

It is believed that when a faculty member's instructional activities place him above the threshold, then the reward system, and hence the institutional incentive, is based on his "other creative activities". In the current system, evaluation of performance in this area is almost totally determined by publication of refereed articles and by acknowledgment from his peers in academia of the value of these contributions. Because the "scholars" with whom he competes and by whom he is being judged are either at graduate schools with large Ph.D. programs, at research laboratories or in think-tanks (e.g., Brookings, Rand, etc.), he is little benefitted by engaging in activity that

improves the quality and relevance to DoN of the Master's-level-oriented program at NPS. A few representative quotes from the faculty help make our point:

"In teaching evaluation, the administration is only interested in weeding out the bad apples".

interview with faculty member

"If his SOFs are OK, then my advice to a new faculty member is to go into his office, shut the door, and write, write, write".

interview with faculty member

It is important to distinguish between "institutional incentives (or disincentives)" and "peer or professional incentives". The recent Faculty Council survey [2] shows that a strong majority of the respondents (over 60%) feel that the institution does not regard teaching as important as research, whereas a similar strong majority feel that their departmental colleagues are committed to excellence in teaching. We believe that the NPS faculty are dedicated to excellence in the classroom and in providing a quality learning environment for the students. We believe that the current PPT process concentrates on "weeding out the bad apples", and there is little incentive for others to improve instruction.

Evaluation of faculty performance in the instructional process is central to controlling the quality of our educational program. Furthermore, faculty who are exceptional in this area should be rewarded in the PPT process. The department chairmen and administration now use primarily the Student Opinion Forms (SOFs) for this evaluation. As feedback from students in a class to their instructor, the SOFs serve a useful function for which they were originally introduced. However, in our opinion, they are an improper mechanism for evaluation of instruction by the administration, especially if they represent the only form of evaluation.

Student ratings are utilized widely across the country for three purposes: to improve teaching, for personnel decisions, and to facilitate student choice of courses and instructors [4]. Only the first two purposes are relevant at NPS. Most of the problems with student ratings have been discussed for some time and are well known. For example, studies have shown that student ratings can be influenced by class size, subject matter, and whether a course is required or an elective [4]. Student ratings are very useful to evaluate attitudinal and motivational goals, but do not measure the appropriateness of course content, the course goals or level of achievement. Nor do they measure activities (such as course planning) outside of the classroom. For these reasons, it is essential that an instructional evaluation system include peer review.

The principal problem with SOFs that we have uncovered is that the faculty believe that they represent the sole means by which a faculty member's instructional contribution is evaluated. This belief is widespread and deeply held despite repeated assertions by the administration that they are not the only thing considered during the PPT process. The SOF scores automatically produce a numerical ranking. With the exception of DRMEC, there is apparently little or no peer input used in instructional evaluation, and there is no independent evaluation of what the students have learned. In spite of some past studies showing little correlation between grades awarded and SOF scores, most experienced faculty believe that they can "manipulate the SOFs" based on how much they ask the students to do and how much they spoon feed them. Some faculty believe that the SOFs, as currently being used, may constitute an invasion of privacy. Others believe that the SOFs can provide an immediate, beneficial feedback to a faculty member regarding his or her classroom instructional techniques.

We believe that SOF scores establish de facto the "threshold level" of performance a faculty member must exceed before he can, if so inclined, ignore further contributions toward the betterment of the NPS instructional program and concentrate solely on other activities. The problem is that the SOFs are a relatively inexpensive evaluation tool. There is no effort required by the faculty or the administration to obtain this data. All other means of evaluation that will be discussed will require additional resources in terms of faculty time (money) and administrative time (support staff: money and billets). Nevertheless, this issue is considered so important that we will recommend that additional resources must be made available in order to maintain the "uniformly excellent program" directed by SECNAV Instruction 1524.2.

The quality of student thesis research and student thesis reports at NPS is a matter of some concern. As mentioned previously, there is an institutional disincentive for faculty to become involved with student thesis work unless they can get the student to do something that will help them with their research. This is, of course, the mold in other graduate schools after which we encourage our faculty to pattern their contributions. However, that mold is created by Ph.D. students for the most part. Many Master's programs at other schools either have no thesis requirement or the option of taking more graduate classes in place of a thesis. At NPS, the thesis report is mandatory in all curricula. Thus, working with students on an operational problem that they have encountered during a previous tour, working on a project that will just help reinforce and bring together things they have learned in a number of courses, or studying the implications of a new Navy

requirement are all marginal as far as a faculty member's advancement is concerned.

Do these projects get done and if so, how? Many faculty are at NPS because they sincerely want to contribute directly to the enhancement of the Navy and DoD. They find these kinds of real world problems challenging and an opportunity to apply their hard learned expertise. They also enjoy teaching and treat the relationship they have with their thesis students as an opportunity to teach in a way that is different and frequently more effective than in the classroom (we will return to this point later). However, we believe that, although there are many examples of fine Master's theses both of the "research faculty generated" type and of the "student problem generated" type, the range of quality of thesis reports is extreme even within individual departments and some theses are being approved that do not meet acceptable standards. There is concern in the administration about this problem and there is considerable, although not widespread, concern among the faculty.

There is considerable feeling among the faculty that a lack of resources at NPS is responsible for a degradation in the quality of the instructional program. Most frequently mentioned are the increasing class sizes and the lack of adequate support staff throughout the school. This lack of support staff includes the administration, the support departments and the support personnel within the academic departments. Although there is some evidence to support these feelings, we find bright spots in the NPS support picture, too.

For example, our teaching loads and class sizes are not particularly large when compared to other schools. Another bright spot is the new multi-year, multi-million dollar instructional laboratory improvement program which has helped keep our laboratory facilities on the cutting edge. (A challenge, in fact, exists now for the faculty to devote sufficient time to assimilate this new equipment into their courses.) In addition, many of the curriculum

sponsors provide travel support for student experience tours at laboratories, systems commands and operational units.

Class size is only one indicator of adequate instructional resources. At present, resources for course and curriculum development are not adequate. The Dean of Educational Development position has been eliminated, and when it existed, it was underfunded so that essentially no help was available for the small curricular groups in the departments that must actually institute the revisions that are always required to keep material current. Furthermore, development of new instructional methods, other than lectures, that will help students improve their learning efficiencies has received very little support. One could argue that because of its unique charter, NPS should be a leader in experimenting with new instructional approaches. At the present time, the budget is designed to pay only for sections taught in the traditional way; in fact, it rewards classes taught with a maximum number of lecture hours.

The lack of responsive support staff at all levels is forcing the individual faculty member to undertake many administrative tasks for which he is ill trained but personally motivated. Travel arrangements, classnote and exam typing, and purchasing are all examples of activities upon which faculty members are spending time inefficiently and ineffectively enough to become frustrated. If NPS is to be a first rate institution, additional resources must be allocated to recruit and effectively organize support personnel who are dedicated to supporting the faculty in carrying out the mission of NPS.

Faculty have a variety of responsibilities including teaching, administration, research, thesis advising, and service to DoN; these activities flow together in the course of a week or a day. It is important that the faculty integrate all these activities so that they reinforce one another. The penchant of auditors to account perfectly for every minute of a faculty member's time and to charge every one of those minutes to only one activity,

(e.g., a particular research account, or teaching, or service to DoN), will, if left unchecked, thwart efforts to accomplish the school's mission.

Closely related to the problems above is the relevancy of the courses and theses to Navy, Marine Corps or other service (or joint service) issues. The unique NPS charter is to relate our instruction to the real world via defense problems. In order to do this, faculty must have some experience to draw upon. Although many faculty at NPS have experience with DoD work, many do not. But even the inexperienced faculty member can research the relationship to the DoN of the material he is teaching and make a specific point of bringing up DoN examples in his classes. However, this takes time and encouragement and positive results for those who make the effort.

The interdisciplinary operational curricula are an aspect of NPS that makes it unique among educational institutions. There are no other institutions offering academic programs in such a broad range of DoD-specific areas as Electronic Warfare, Antisubmarine Warfare, Space Systems Operations, or Command, Control and Communication.

Universities have found it difficult to do interdisciplinary programs well, and NPS is no exception. The challenge is at least two-fold: teaching and faculty development. Courses in interdisciplinary programs can be very difficult to teach well. The breadth of the curriculum tends to limit the depth of any particular course. There may be no appropriate textbook, and the students might not have had the range of prerequisite courses desired by the instructor. In addition, the level of the course material might be such that the faculty member's research program is little aided by his course preparation efforts. It is not surprising that teaching in the operational curricula tends to be less than popular among many faculty members.

While the early courses in the operational curricula typically contain material from a single academic discipline and are usually taught by an expert in that discipline, the higher-level and capstone courses are intended to integrate material from the entire curriculum and across several academic disciplines. These high-level courses are very important to a curriculum's success. Unfortunately they are also the most difficult to teach well. These courses are intended to tie together a complete program of study. The instructor must have a vision of the entire curriculum plus the breadth of knowledge and the teaching skills to convey that vision. When this critical integration function is not accomplished, or is left to the student, an otherwise excellent interdisciplinary program can reduce to a loosely related collection of multidisciplinary courses. The typical successful academic researcher focuses on a particular set of ideas or tools and does not generally develop extreme breadth. One of the key issues facing the operational curricula is that of developing broad, interdisciplinary experts who can prepare and present these unifying courses.

The Academic Groups have been established to provide academic guidance, direction and leadership for the operational curricula. A number of activities important to the success of the operational programs periodically require active support and involvement of selected members of the Academic Groups. At present, that support is often not forthcoming because there is inadequate reward and recognition for such faculty contributions.

The Committee believes that there are two key requirements which, if met, will strengthen the operational curricula:

1. Vigorous programs of research involving NPS faculty (permanent, visiting or adjunct) should be established in operational areas.
2. NPS faculty must not be discouraged from participation in the operational programs.

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2. NPS faculty must not be discouraged from participation in the operational programs.

In order to focus research efforts, it is also felt that a significant amount of research funds should be controlled by the appropriate Academic Group or Academic Group Chairman. This will encourage development of coherent programs and provide incentives for faculty involvement. The interdisciplinary experts teaching capstone courses would be expected to be those faculty members most directly involved in these research programs.

This report speaks in several places of broadening the traditional measures of academic accomplishment to accommodate the special mission of NPS. These steps are essential to encourage more extensive NPS faculty participation in operational programs. Many of these steps would also serve to strengthen NPS faculty interest in application of their expertise to DoN problems.

The Committee has had some discussion of how the Academic Groups should be organized to most efficiently guide the operational curricula. Various organizational options have been suggested, from forming separate academic departments for the operational curricula to complete incorporation into existing academic departments. The Committee believes that it would be worthwhile to reexamine how the Academic Groups are organized and what authority they are given, and to determine whether changes should be made that will enhance the effectiveness of the operational curricula. The Committee also strongly believes that whatever the organization, the two key requirements of a vigorous research program and no disincentives for operational work must always be met.

Recommendations

1. The instructional evaluation system at NPS should be changed as follows:
 - a. The SOFs should be used solely to improve upon instruction. The information obtained from the SOFs should go only to the individual faculty member. No one else should see this information unless desired by the faculty member. A faculty and student committee should investigate if the SOF questions should

be changed to improve upon the questionnaire's ability to provide useful information to the instructor. They should also seek ways to expedite the processing of the SOF data in order to encourage efficient feedback.

- b. Each department should develop an instructional evaluation system to replace SOF. Each department must establish an instructional evaluation committee which will be responsible for establishing an instructional evaluation system for the department. Each department should submit its instructional evaluation plan to its Division Dean for approval. It is expected that the evaluation system will include input from students (e.g., exit interviews of graduates), as well as from faculty (e.g., peer evaluation from class visitations and team teaching) and will include an evaluation of thesis advising. Comments by the department curriculum committee on an individual's contributions to curriculum improvements, course development, laboratory and unique instructional method development, comments by thesis supervisors on the assistance of the second reader and vice versa, survey of course journals to determine content and level of material being presented and adequacy of the examinations and appropriateness of grades awarded, and comments by a mentor if one has been assigned to a new faculty member, would all be valid inputs to the system. The evaluation should be performed less frequently than once a year for those faculty who are not at one of the critical career decision points.
2. More resources should be made available in the faculty budget for course development, for maintaining, improving and monitoring the quality of the instructional program, and for developing new instructional methods to improve learning efficiency. It is recommended that a minimum of 10% of the faculty teaching budget be used for this purpose. If additional resources are not provided by DoN, then we must reduce the number of sections taught by 10% in order to institute the required maintenance and assure the "uniform excellence" directed by the Secretary. The front line responsibility for curriculum control is with the academic departments. Each department should be required to have an active curriculum committee (with sub-committees as appropriate to sub-specialities) within the department. One half of the resources identified above should be allocated to the departments and should be utilized by the chairmen, their academic associates and their curriculum committees for curriculum improvements and instructional evaluation purposes. The curriculum committee will also be responsible for evaluation of all new courses proposed by the department. At the end of each academic year, the departments will be required to submit a written report to their Division Dean on the state of their curriculum and on how they have utilized the resources they have been allocated for this purpose.

A school-wide Instructional Council should be established that parallels the duties of the Research Council. The other half of the resources set aside for instructional program development would be allocated by the Instructional Council. Individual faculty members

will submit proposals to the Council for projects to enhance the delivery of graduate level education to our students and to the DoN in general. Such a project might be a book on ASW that is published first at NPS and ultimately by the government printing office. A project to develop a series of personal computer experiments in digital signal processing could be funded. PSI course development might be funded particularly for DoN unique topics. Educational research projects that gather data or experiment with new methods of improving learning efficiencies could be funded. The Council should be staffed by those at NPS who are primarily interested in teaching techniques and educational research.

3. The NPS administration, department chairmen, academic associates and curricular officers should reinforce the policy that thesis projects are a central part of a student's education at NPS and that they are to be of the highest possible caliber commensurate with the student's abilities. The thesis project represents a melding of the three activities of instruction, research and service to DoN. As such, it represents an ideal opportunity for the faculty to be in close professional contact with our officer students on a problem of long term interest to the Navy and DoD. The student thesis should therefore represent the culmination of our graduate education. The ultimate responsibility for the problem selection and the quality of the thesis report lies with the thesis supervisor. Ample incentives should therefore be present to attract the faculty into this most rewarding yet very time consuming activity. However, at present, the faculty believes that insufficient credit is being given to thesis advising in assigning annual teaching loads. Department chairmen must be very diligent in their course assignments to insure that faculty who advise thesis students are given proper credit and that faculty who do not advise students have a full course load (e.g. 8 courses) during the academic year equivalent to the 33 contact hour equation now in use. Further, faculty who advise large numbers of students should be entitled to a reduced course load commensurate with the amount of time they are spending advising their students.

Each faculty member should be evaluated on his/her performance as a thesis advisor and rewarded for sustained quality efforts. The second reader and department chairman serve primarily as quality control on the process and as such are, along with the student, in the best position to contribute to the evaluation. Evaluation should not be performed by those not personally supervising students. What constitutes appropriate topics and what represents an outstanding or a poor thesis varies greatly from discipline to discipline. Each department should make these judgments itself; however, the departmental policy should be stated clearly and its importance reinforced with each faculty member on a regular basis. Finally, it should be stated school policy that a faculty member and his or her students will be supported in their efforts to find applications for their work within DoN laboratories, staffs and commands. Success in this regard should constitute a contribution to the faculty member's external activities.

In order to strengthen the operational curricula, the following specific actions are needed:

4. Research money should be provided to the Academic Groups to encourage the development of strong research programs in the operational areas. The faculty engaged in those programs will as a matter of course be interested and capable of teaching the crucial capstone courses in the operational curricula and supervising theses. Trying to bring faculty who are not actively involved in research up to date to teach those courses in the operational areas and be fully conversant with the critical issues is very difficult and in the end is unlikely to be successful.
5. The role of the Academic Group Chairman in promotion and tenure proceedings should be increased. One way of accomplishing this is to require that, when appropriate, a Group Chairman, or someone he designates, should serve on a candidate's promotion/tenure committee.
6. A faculty committee should be formed to examine the organization of the Academic Groups and the resources they have to manage the interdisciplinary operational curricula, and recommend changes that would enhance the effectiveness of the operational programs. This committee should consider how other educational institutions conduct interdisciplinary programs. Particular attention should be paid to the issue of faculty development and strategies to help guarantee long-term program vitality and viability.

5. FACULTY REWARD SYSTEM

Background

The faculty reward structure at NPS must place equal emphasis on teaching, research, and contributions to DoN, and it is important for the health of NPS that this requirement be met collectively. The strength of this institution lies in the breadth of knowledge and creative activities of its faculty. To mandate prescribed activities for all faculty would stifle creativity and erode the quality of the educational program. Instead, NPS needs a mix of talents which crosses traditional academic disciplines as well as subspecialty areas of direct relevance to the Navy and Marine Corps. To foster this mix requires a flexible reward system which recognizes that a variety of activities are important to the mission of the institution, while also requiring that certain absolute standards be met. At the Naval Postgraduate School, all faculty must strive for excellence in the instructional process. As a consequence, it is expected that all faculty should devote a significant portion of their energy to this most important activity and that the reward system will sufficiently recognize high quality instruction. Service to the Navy in addition to instruction of officer students onboard NPS is expected. Finally, research at NPS is essential to its graduate education mission, requiring that all of the faculty should be active in research.

However, it is artificial to divide faculty activities into teaching, research and service to DoN. This is amply illustrated by the fact that maintaining up to date instruction that includes material of direct interest to the Navy is a valuable service to the Navy. Division into the three categories leads to such beliefs as "a person's cup cannot be empty in any of

the three." Such a philosophy can easily cause evaluation to gravitate toward using teaching and research as the only criteria, with emphasis on research as the demonstration of scholarly/creative activity. This is due to the ease of quantifying research results (number of refereed publications) and our natural tendency to emulate other graduate institutions where research productivity is the primary measure for promotion.

For purposes of pay, promotion and tenure, recognition should be given to faculty members who perform their duties at NPS in an exemplary manner and also carry on activities which enhance the reputation of NPS in the outside community. Being an educational institution and a part of the Navy, the outside community for us includes both academia and DoN. Thus, faculty should be judged on two criteria, internal contributions to the institution and external contributions which demonstrably enhance NPS's reputation in either the academic community, DoN/DoD, or both.

Problems

In the current pay, promotion and tenure procedures, we believe that the faculty are treated equally in the application of the current standards. School-wide review of promotion/tenure documentation packages tends to standardize methodologies. The avenue of the Professional Practices Committee is a good check in the system [5]. However, policy, the current practices in implementing policy, and faculty perceptions of current practices are all important in the faculty reward system. Perceptions control faculty behavior as much as, and perhaps more than, stated policy. Thus, though we produce no hard evidence to support the following stated problems, all the points we make are an expression of the perceptions of a significant fraction of the faculty:

1. Current PPT standards over-emphasize refereed publications.

2. There are disincentives for participating in interdisciplinary operational curricula and developing Navy-related instructional materials.
3. The PPT decision process is too far removed from those who are in the best position to evaluate a person's work.
4. There is too much reliance on simplistic quantifiable information (e.g., average of SOF scores or number of journal publications) when evaluating a person's performance.

It is important to point out that our current PPT practices and what we perceive as problems are not unique to NPS. Where NPS is, at the present, is a natural consequence of its changing from a primarily teaching institution to a high quality graduate institution with a research program that is necessary for that level of education. All across the country, other institutions and national level panels are investigating the education process and writing reports stating that attention to instruction has degraded to a dangerous point [3]. In the teaching-research spectrum, we believe NPS is far better than most graduate degree granting institutions in attention paid to quality instruction. Nevertheless, what we propose below will help to strengthen our commitment to instruction, to the interdisciplinary operational curricula, and to service for the Navy.

Recommendations

1. All faculty at NPS should be willing to serve DoN in ways other than instruction. Our institution is an integral part of the Department of the Navy. All faculty should therefore have a keen interest in the Navy and its operations, and a healthy outlook toward improving the effectiveness of this service and DoD.
2. Faculty at NPS should be judged on two criteria for PPT: internal contributions to NPS and external contributions which demonstrably enhances NPS's reputation in either the academic community, or DoN/DoD, or both. Faculty at NPS are expected to be strong contributors to high quality, relevant instruction and to be active in their profession and in their service to DoN. Adequate performance in these areas should not automatically qualify an individual for merit increases, promotion, or tenure. For example, doing an adequate, even exemplary, job of teaching 1000-3000 level courses and making only a minimal impact on the world outside NPS should not qualify a faculty member for advancement. Impact on the outside world can be achieved in any

area of faculty performance, including instruction. The quality and quantity of performance above acceptable should determine the rate at which an individual progresses through the academic ranks. Promotion to full professor requires that the person demonstrates consistent leadership in at least one area of faculty activity, and have "meritorious" performance in both internal and external service.

Judging an individual's qualifications for advancement should be on the basis of his or her meritorious performance. By this is meant performance in both internal and external service that is worthy of note. Listed below are some typical examples of internal and external activities that indicate such meritorious performance. The implication is not that a person should pick "one from column A and two from column B" and get promoted, but that the successful faculty member should be engaged in a significant amount of meritorious work.

Internal Activities

- o demonstrating flexibility and quality in instructing graduate level and applications oriented courses,
- #* introducing new material in curricula and developing new courses, particularly special topics courses with DoN relevance,
- o developing or implementing creative teaching methods (such as computer-aided instructional materials) to improve upon student learning efficiency; developing extensive instructional material,
- o exercising leadership in developing and/or refining curricula,
- o developing instructional laboratories, including specifying equipment and designing experiments,
- o providing service as academic associate, associate chairman, chairman of a school-wide committee, etc.,
- o contributing to interdisciplinary research projects,
- o directing research efforts of thesis students,
- o tutoring students who need remedial work,
- # teaching capstone courses in applied areas, and
- # teaching in interdisciplinary curricula.

*Note that some of the above activities are indicated with the symbol #. These are Navy related activities that have not been sufficiently rewarded in the past and to which attention must be paid in the future to insure not only that they are adequately rewarded but that the faculty understands that the PPT criteria have changed.

External Activities

- o creating products of direct use to Navy operations, both shore and sea based,
- o publishing research results in refereed archival journals or conference proceedings at a regular rate,
- o providing service in a professional society through elected offices, committee work, conference planning, editorial work, paper/proposal review, etc.,
- # planning and evaluating fleet exercises,
- o contributing to a Navy multilaboratory research project,
- o publishing a textbook that receives acceptance external to NPS,
- # offering on-campus and off-campus short courses to DoN personnel,
- o creating instructional material that receives significant use outside NPS, (textbooks, course notes, teaching methodologies, etc.),
- # acting as a consultant for operational commands and other DoN organizations,
- o providing service to high level positions in DoN,
- # publishing technical reports, either unclassified or classified, in a DoN or non-DoN research program,
- o contributing chapters in research monographs,
- # presenting research results to operational commands and other DoN organizations,
- # contributing to research programs with operational units, laboratories, systems commands, and headquarters of the Navy and Marine Corps, and
- # providing service to DoN (and to the DoD community) by contributing in workshops, panels, advisory boards, and by liaison with laboratories.

Evaluation Difficulties

There are well-established methodologies for evaluating the standard academic careers found in most graduate schools. The simplest is judging research productivity: count publications in well-respected journals and dollars obtained. Methodologies also exist for evaluating instruction, although they are less well agreed on (this was discussed earlier in Section 4). At NPS, the situation is more

difficult because of our unique requirements to directly support the Navy. Applied, and even classified, research, applied instruction, and certain types of service to the Navy are more difficult to evaluate than traditional academic activities.

Another area of concern is service to the Navy. Service on high level panels is prima-facie evidence of quality service. More difficult to evaluate is participation in fleet exercises, usefulness of computer codes developed for Navy use, etc. Direct contact must be made with the Navy unit involved to assess the impact of the professor's participation and results. The key is to determine if the professor's work is gaining acceptance by the Navy. It is not sufficient evidence that the Navy is willing to fund the professor's work.

NPS places significant weight on bringing new and up-to-date material into the classroom. With the wide range of applied material we teach, it can be difficult to judge whether certain material is up-to-date or merely applied examples that the professor has had available for some time. When it is necessary to do so, an effort should be made by departmental instructional evaluation committees to submit instructional material to outside experts to obtain a judgment on its currency.

Finally, dissemination of instructional materials outside NPS requires special evaluation. The key is how wide is the acceptance; to what extent has the outside academic community found the material useful? In this situation, the chairman should determine the number of universities, classes and students that are using the material and obtain a subjective evaluation of the material by outside faculty.

3. Technical Reports (classified or unclassified), when used as evidence of research productivity during the PPT process, should be externally reviewed. Publications in refereed journals is a commonly accepted standard for research productivity. Since technical reports are written with no review by outside experts, it is important that they be subjected to some form of outside review if they are to be used as evidence of productivity. The Provost has proposed a procedure for obtaining outside peer review of technical reports (Appendix C). This Committee believes that if a significant fraction of a faculty member's research output is in reports, the person should choose reports he/she wishes to have reviewed so that they can be used in the PPT process. His/her chairman would submit such reports to outside experts for evaluation. This process should be done on a regular basis so that a continual, real-time evaluation is available. The objective is to ensure that the same standard for professional contributions is applied to technical reports as is presumed to apply for publication in refereed journals.
4. NPS should stress a flexible role model for faculty professional development. Because of the developmental nature of academic careers, promotion and evaluation criteria must vary over one's career. We should not expect the same levels of performance, nor necessarily the same types of performance, from a junior assistant professor as from a

senior full professor. For example, what constitutes outstanding teaching for a very experienced teacher should not be the standard for a new instructor. Similarly, senior faculty should be held to a higher standard for research productivity and service to DoN/DoD than a junior assistant professor. It is important for young faculty at NPS to place emphasis on establishing their professional reputation, whereas senior faculty are expected to exercise leadership in a number of dimensions (e.g., curriculum development, academic governance, research entrepreneurship, etc.).

Furthermore, we should expect a wider variety of career routes and accomplishments at the senior ranks than at the most junior ranks. Assistant professors are generally expected to fulfill more conventional accomplishments, and award of tenure at the associate professor level would depend primarily on a person's demonstrating that he or she has the ability to be a practicing professional in his or her field.

Finally, because of the unique nature of NPS, the school employs people from the Navy Laboratories and operational communities who have unique skills. Such people are established professionals when they arrive on campus and will have subsequent career patterns which are unique to NPS.

As has been stated above, NPS should reward a wide range of faculty careers. To better foster understanding of this system, it is useful to provide examples of performance that would lead to success in the PPT process, as well as counterexamples. Such examples are presented in Appendix B of this Report. Cases are presented for tenure as well as for promotion to associate and full professor because of the different criteria required in each circumstance. The cases presented are not meant either to be exhaustive or to indicate an exact career profile.

5. During the PPT proceedings, the role of the departmental evaluation committee should be strengthened. The current PPT proceedings have one component that is both a strength and a weakness: having a major component of the decision-making process be the assembled deans and all chairmen. The strength of this process is that it standardizes criteria and assures fairness of treatment school-wide. Also, the chairmen are most familiar with school goals, current policy to implement them, and how PPT can be used to insure the goals are met. The weakness is that much of the decision on an individual case is made by people who are far removed from the candidate's field. There is considerable feeling in the faculty that evaluating applied work, especially service to DoN, will be even more difficult with this methodology.

The strength of schoolwide review can be kept, and the need to make the primary evaluations by people more knowledgeable of the candidate's field fulfilled, by strengthening the role of the departmental evaluation committee. At the present time, departmental committee activities are not standardized and there is a tendency for

the committees to act as advocates for the candidate. Departmental evaluation committees should act more as investigative bodies and do a critical, in-depth evaluation of the candidate's qualifications. Some of the evaluation burden would then be removed from the collective chairmen in making their decisions. The resulting strengthening of the voice of the departmental committee would make their report the primary consideration in PPT decisions and relieve the chairmen/deans group from having to study the detailed numerology of a case.

Thus, what follows is a suggested methodology for strengthening the departmental committee's role. It is not expected that all departments would exactly follow these guidelines. However, it is important that an exact methodology be spelled out as guidance to the academic departments.

Suggested Department Procedure

1. It is expected that each person in the department who is a future candidate for promotion/tenure would receive guidance from either the Department Chairman or an individual counselor or group appointed by the Chairman.
2. Each year, within each department, a deliberating body would meet to consider the cases of all faculty who are not full professor. This must be done early in the PPT cycle.
3. For the person who is to be considered for advancement for promotion/tenure, the Chairman appoints a three person committee to evaluate the candidate. The committee would be constituted as follows:
 - a. at least one member a full professor,
 - b. if appropriate for the candidate, an Academic Group Chairman or that Chairman's appointed representative,
 - c. no member of academic rank lower than that to which the candidate aspires, and
 - d. one committee member from outside the department.

Many of these conditions are now satisfied by the departments in the constitution of departmental committees. However, two of these requirements, items b and d, should be regularly applied. Item b is important if we are to insure proper evaluation of faculty members who have been active in teaching and/or research in the operational areas. Item d is intended to monitor the integrity of the process. A committee member from outside of the department should help to avoid significant differences in the standards and objectivity that are being applied in the evaluations in the different departments and therefore should serve to strengthen the weight that can be given to the committee's report.

4. The committee acquires the information needed (specified by school-wide guidelines) to evaluate the candidate. The Chairman would guide the committee to insure that school-wide standards are being met with regard to the quality of the information.
5. All faculty members in the department who are tenured, and of at least the rank to which the candidate aspires, meet to hear a presentation by the candidate's evaluation committee. After the presentation and discussion, the faculty votes on the candidate. A substantial majority should be obtained if the candidate's case is to be presented to the department chairmen and deans of the school.
6. The promotion/tenure package is then forwarded to the Provost, and should contain the following:
 - a. the vote of the department,
 - b. a written statement by the departmental evaluation committee, providing their evaluation of the candidate,
 - c. a similar statement by the Department Chairman, (and appropriate Group Chairman),
 - d. an optional statement by the candidate outlining accomplishments to date, planned future activities, and how those activities will contribute to the mission of NPS, and
 - e. all outside letters obtained for the candidate's case.

It is expected that these written statements will contain subjective evaluations of the candidate's value to the department, NPS, and the Navy, stressing contributions to the mission of NPS. In addition, the evaluation committee's statement must contain a description of the information gathered and evaluation procedures used.

6. At the completion of the PPT proceedings, a significant amount of information pertaining to the decisions made at the Dean's Council should be disseminated to the candidates through their Department Chairman and their Departmental Evaluation Committee. It is important that a significant amount of information flows back down the pay, promotion and tenure chain to the Chairmen, the candidates, and the school. Each decision made on the case, and the reasons for the decisions should be communicated to the candidate through his Chairman and his Departmental Evaluation Committee. This should include the results of the Dean's Council deliberations and the tally of the Chairmen's vote.

Such feedback is important for individual candidates and for the faculty as a whole. When a quantity of factual information is combined with the specific criteria listed above, it should be clear to all that emulation of a specific, successful faculty member is not necessary but that an individual career plan that best suits the

person's strengths and stresses quality service to NPS's mission is the optimal route to success.

7. The current format of the Faculty Activities Report and the Guidelines for PPT should be revised to reflect the above-outlined changes in faculty promotion/tenure criteria.
8. NPS should seek and maintain realistic resources to insure that proper incentives/rewards are available to the faculty to foster their continued professional development. In order to greatly aid in the implementation of the proposed changes in faculty activities and to foster continued excellence in our mission, a Professional Development Plan should be established. The Plan should foster teaching effectiveness, a relationship with DoN and continued professional growth. The Plan should include the following actions:
 1. The number of merit pay steps available to the faculty should be increased in order to provide sufficient resources to the Department Chairman to reward meritorious service.
 2. More release time should be available in the faculty budget to allow faculty to develop new course material (particularly Navy-oriented).
 3. Funding should be readily available for long-duration travel (e.g. an intersessional or one quarter) of faculty to Navy-related establishments.
 4. The sabbatical program should be re-emphasized as an opportunity for NPS faculty to seek rejuvenation in their fields, to study new disciplines, and establish closer relationships with DoN technology.

The above recommendation will require additional funding. We encourage the administration to make a concerted effort to obtain the funds needed to put these incentives in place so that we can effectively implement SECNAV Instruction 1524.2.

6. CONCLUDING REMARKS

The Committee has made a variety of recommendations which we feel will strengthen our institution and its supporting role to the Navy. Of these recommendations, the following require specific actions:

1. Faculty at NPS should be judged on two criteria for PPT: internal contributions to NPS and external contributions which demonstrably enhance NPS's reputation in either the academic community, or DoN/DoD, or both.
2. The current format of the Faculty Activities Report and the Guidelines for PPT should be revised to reflect the above-mentioned changes in faculty promotion/tenure criteria.
3. Technical Reports (classified and unclassified), when used as evidence of research productivity during the PPT process, should be externally reviewed.
4. Each academic department should develop an instructional evaluation system to replace SOF. The SOFs should be used solely to improve upon instruction. SOF information should go only to the individual faculty member.
5. More resources should be made available in the faculty budget for course development, for maintaining, improving and monitoring the quality of the instructional program, and for developing new instructional methods to improve learning efficiency.
6. Each department should be required to have an active curriculum committee within the department.
7. A school-wide Instructional Council should be established with duties to parallel those of the Research Council.
8. Research money should be provided to the Academic Groups to encourage the development of strong research programs in the operational areas.
9. A faculty committee should be formed to examine the organization of the Academic Groups and the resources they have to manage the interdisciplinary operational curricula, and recommend changes that would enhance the effectiveness of the operational programs.
10. A faculty travel and assignment office should be established to assist faculty in travel plans in order to facilitate faculty travel and experience tours.

As we conclude this Report, it is natural to ask: what impact will the Report make on the actions of the faculty and administration? How will our

recommendations be implemented? Will there be some initial activity and change, only to gravitate in a short while back to the way we have been operating? What kind of institution will this be in 1990 and beyond?

Clearly, the implementation of the recommendations we have made presents a serious challenge to us all. To be successful in these changes will require complete support and cooperation between the faculty and the administration. During this process, it is expected that the Division Deans, the Department Chairmen and the Faculty Council will be intimately involved.

There is a significant price tag associated with these recommendations --a price tag involving the time of the faculty, the administration and the support staff, as well as strong financial support. When resources are short, this will not be easy to accomplish. A perennial problem exists to decide on the division of operating funds between current activity (i.e., teaching the students we now have on campus) versus improving our future capabilities (i.e., preparing for tomorrow's students by developing new courses, new research programs and new Navy-relevant instructional materials). Let us therefore take the initiative to make a strong investment in our future. NPS has existed for 77 years and has experienced numerous changes during that time. The time has come to change again. Let us do it wisely.

7. REFERENCES

1. SECNAV Instruction 1524.2, "Policies Concerning the Naval Postgraduate School", 23 May 1986
2. Faculty Secretary Memorandum of 25 November 1986 with Faculty Survey Results Enclosure
3. Quality of Engineering Education Project: Final Report, American Society for Engineering Education, Washington, D. C., 1986
4. W. J. McKeachie, Teaching Tips, A Guidebook for the Beginning College Teacher, 8th Edition, D. C. Heath and Company, Lexington, Massachusetts, 1986.
5. Faculty Handbook, Naval Postgraduate School, p. v-3.

Appendix A
Charter for
Ad Hoc Committee on Faculty Activities,
Incentives, and Evaluation

The Secretary of the Navy in his instruction 1524.2 provides the rationale for the School and acknowledges its accomplishments but calls for increased focus in programs and faculty activities to apply discipline expertise to increasing the effectiveness of naval operations. Paragraph 5 of the instruction pertains specifically to faculty but implications for the faculty appear throughout the instruction.

As stated in paragraph 5 of instruction 1524.2 the NPS faculty evaluation system for pay, promotion, and tenure should put equal emphasis on a) quality of teaching, b) publications and research, and c) contributions to mission of Navy and Marine Corps. The Committee is asked to consider these matters and to recommend via a written report what steps should be taken regarding faculty activities and evaluation that would serve to accomplish this objective.

The Superintendent, RADM Austin, feels that the points to consider include the following:

1. Faculty Naval Orientation and Experience

- o The process by which new faculty learn about naval warfare.
- o The incentives necessary for faculty involvement in applying their discipline expertise to problems in naval warfare.
- o How faculty contributions to naval operations should be documented and evaluated.
- o In many ways the intent of the Instruction can be met by increased faculty involvement in the operational curricula programs including teaching and research in relevant Navy areas. What experience do we have with faculty involvement in the operational curricula (or operational aspects of any curricula or discipline) that is helpful in thinking about the committee's change?

2. Student Research: Naval Orientation and Academic Relevance

- o How might thesis selection be a stronger part of guidance.
- o How NPS might insure that academic/naval theses of value are properly brought to the attention of high levels within the Navy.

3. The Present Procedures and Norms in Pay, Promotion and Tenure (PP+T)

- o Does the present PP+T system place emphasis in the addressed areas? If not, how can it be improved?
- o Is the present PP+T system fair and consistent and does it award potential future contributions as well as past performance?
- o Is teaching excellence adequately evaluated?
- o Is there over emphasis on research?
- o Is there a balanced evaluation regarding publishing?
- o Does the faculty respect the PP+T system as being:
 - a. just
 - b. such that it promotes those best suited for future contributions to the NPS mission
 - c. Thorough
 - d. Resistant to special interests or favoritism

4. Other

- o Are student results adequately evaluated?
- o How appropriate academic standards are to be safeguarded.

It is suggested that the Committee hold open meetings to solicit faculty input. It is requested that an interim report be prepared by 30 October 1986, and that a final report be ready by 1 February 1987.

APPENDIX B: FACULTY CAREER EXAMPLES

Associate Professor Cases A and B.

Both Professors A and B came to NPS immediately after receiving their PhD. Each published his/her thesis and a second related article. Both began doing research at NPS, Professor A beginning her own project and Professor B joining an ongoing effort. Subsequently, both published, A more frequently and as the only or principal author, B as a co-author.

Professors A and B are quality instructors with A tending to lean more to high level graduate courses. Both use texts with which they are familiar from graduate school, or available notes from their department. Both advise thesis students and also serve as second readers.

After two to three years at the school, the careers of Professors A and B begin to diverge.

Case A continued

Professor A continues to be a good instructor but her efforts are concentrating more on research. She publishes in quality journals at a high rate and is becoming known in her field as a bright new star.

Professor A is beginning to apply her expertise to Navy problems, receives Navy support for her research, and makes visits to Navy laboratories to learn about Navy needs.

After the appropriate time, Professor A is advanced to Associate Professor, and later awarded tenure based on the school's belief that she will become prominent in her field and that her interest in Navy problems will grow productively.

Case B continued

Professor B has demonstrated the ability to do quality research but it is obvious that his interests are primarily instruction. His participation in research projects begins to decrease except for his willingness to advise thesis students.

Professor B is an innovator in his department in developing computer-aided instruction. He is beginning to create new material to support the courses he teaches, and these materials are well enough documented that they can be distributed and used by others in the department. He is beginning to visit Navy laboratories or operational units to learn about Navy problems and is bringing that knowledge into the classroom.

Professor B's innovative educational methods are of high enough quality that he is beginning to publish them in educational journals. He is developing a community of outside educators who are interested in his techniques.

Professor B is advanced to Associate Professor and later awarded tenure in the belief that he will continue to grow as a leader in the outside educa-

tional community and that his application of Navy problems in course work will increase the relevance of NPS education.

Case A counterexample

Professor A becomes engrossed in high quality research in her field. Her instruction continues to be adequate, even of high quality, but she has no time for thesis students whose work would not help her publish. She tends to shun applied research, including Navy applications, viewing it as a distraction from her commitment to academic research.

Professor A is not awarded tenure because she does not meet the requirement of devoting part of her professional career to serving the Navy. She leaves NPS and has a distinguished career at another university.

Case B counterexample

Professor B concentrates on high quality instruction and is extremely popular with the students. He shows a willingness to include Navy applications in his courses but tends to follow the lead of others in obtaining this material. He produces class notes for others when asked to do so. He tends to concentrate his efforts inside NPS, showing little or no inclination to disseminate material he develops outside NPS.

Professor B is not advanced to Associate Professor nor awarded tenure in the belief that he will make no impact on the world outside NPS.

Full Professor Cases

As indicated in section 5 of this Report, the range of career profiles at the lower academic ranks will be narrower than at the upper ranks. It would be difficult to try to follow the various branches that Professors A and B might take, and of course, A and B are by no means exclusive examples of successful careers. The following are cases of promotion to full professor, indicating the breadth of acceptable service.

Case 1.

Professor Z has been teaching undergraduate and graduate level courses in both his traditional discipline and in the ASW operational curriculum. He continually enriches courses with examples from his direct knowledge of current naval technology. He steadily advises thesis students on topics of direct interest to the ASW curriculum sponsor. He presents papers at Navy-sponsored workshops and publishes some papers in archival journals. His research work on underwater acoustics has helped the Navy develop a superior sonar system. He routinely reviews papers for professional journals and has extensive committee service at NPS.

Case 2.

Professor Y primarily teaches graduate level courses and advises numerous thesis students. He has been actively funded by DoN and NSF for several years. He has established an international reputation through publications in the open literature and through conference presentations. He has offered a

short course on his specialty to several Navy laboratories and systems commands. He has been active in his professional society as a conference organizer, has served as Academic Associate, as a member of the Research Council, and on various department committees.

Case 3.

Professor X teaches 2000 and 3000 level courses regularly to large numbers of students. He has created new courses (including supporting laboratories) and integrated them as required courses into the curriculum. He has established a computer-aided tutorial program in one of the 2000 level courses which has been well received by the students. He is an officer in the American Society for Engineering Education, where he presents papers on different teaching strategies and new laboratory techniques. He has recently published a textbook which has been adopted by a variety of institutions across the country. During intersessional periods he has consulted at Navy laboratories, giving lectures on several topics of interest. He regularly will advise a thesis student on a topic of interest to those laboratories. He is Associate Chairman in his department for instruction.

Case 4.

As an associate professor, Professor W continued to get assigned DoN-oriented courses for which no textbooks were available. Her research became more DoN oriented, as did the theses she advised. The DoN found her research and theses to be useful, and began to call on Professor W as a consultant. She has become an expert in the areas of technology and Naval operations that are impacted by her field. She concentrates on writing the results of her research in classified technical reports, and giving occasional presentations at meetings of professional societies. Her reports have had a considerable impact on and have gained wide acceptance within DoN.

Case 5.

Professor V is an ex-Naval officer. He possesses a Master's degree but no PhD. His military experience has made him a recognized expert in military strategy. He has developed and has taught several required courses in different curricula. He works jointly with several other faculty members on interdisciplinary research projects. He regularly serves on Navy advisory boards, and is an officer in the Military Operations Research Society. He has written various classified technical reports which have received good to excellent reviews by an external team of experts.

Case 6.

Professor U was hired as an Associate Professor after 15 years of experience at APL/JHU. He has a PhD in ME from UC Berkeley and spent his professional career, prior to coming to NPS, working on guidance and control problems in Navy Surface-to-Air missiles. He is considered an expert in Navy missiles and has authored numerous classified reports in this field.

Since coming to NPS, he has been instrumental in introducing factual DoN missile examples into a variety of the standard curriculum courses in the AFRO department where he teaches. He has also developed a special course on

Surface-to-Air missiles for the Navy Intelligence, EW and C³ students which has been well received. He has continued his own work through a small yearly contract with NAVSEA which has provided regular thesis projects for 2 - 3 students per year. He is regularly sought out by NAVSEA to sit on the technical panel that reviews SAM test and evaluation data.

Cases dictated by unique NPS requirements

Because of the unique nature of NPS, we occasionally need to hire senior people who can fill a specific, non-standard requirement. Such individuals, who receive tenure, are indicated below. Note that all cases fill a specific Navy need.

Case 1.

Professor T was hired directly as an untenured full professor based upon her nationally preeminent record in publications. Although she had no previous experience with DoN or DoD, her field has direct relationship to pressing Navy needs. She has within two years demonstrated exceptional enthusiasm in developing DoN/DoD relationships and is becoming visible with important NPS constituencies. She has been successful in obtaining research sponsorship from Navy organizations and has been invited to participate on DoN/DoD committees and panels. Her teaching performance has been superior and she has supervised an average number of theses.

Case 2.

Professor S was also hired directly as an untenured full professor. Although his publication record is respectable, it is not sufficiently distinguished to merit promotion at a first rate school. The NPS decision to hire at the full professor level was based primarily on market considerations in a scarce academic discipline. Professor S's teaching performance is superior and service to the NPS community has been dedicated and spirited. Contributions to DoN/DoD have been gradually increasing over a four year span. Professor S now has a solid reputation among several Navy constituencies and is able to obtain research sponsorship independently on a routine basis.

Case 3.

Professor R teaches in the ASW curriculum. He was hired by NPS at the rank of professor. Before coming to NPS, he was Assistant Secretary of the Navy for research, engineering and systems, a job he performed well for several years. Prior to that, he was director of research in a large defense-oriented U.S. corporation. He has been on many defense advisory panels, and has frequently been used as a consultant by DoN. In earlier stages of his career, he published in the refereed literature of his original discipline. Since coming to NPS, he has restructured and taught capstone courses in the ASW curriculum. No textbooks exist for these courses. His teaching evaluations have been very good. He has advised several ASW thesis students, working with him on a DoN-relevant, highly structured ASW research project having the promise of enormous short-term payoffs for the Navy. The research is resulting in classified theses and technical reports.



DEPARTMENT OF THE NAVY

NAVAL POSTGRADUATE SCHOOL
MONTEREY, CA 93943-5100

IN REPLY REFER TO
NC4(74)
4 Sep 1986

MEMORANDUM

From: Code 01
To: Chairmen

Subj: REVIEW FOR CLASSIFIED RESEARCH REPORTS

1. The instructional and thesis requirements of many curricula require that a significant portion of NPS faculty have knowledge of the operational problems of the military. Most NPS faculty obtain such knowledge through their research which is performed for military organizations, through their contacts. Most of this contact, however, is with the "shore" side of the Navy and it is also necessary to become familiar with the "at sea" type operational requirements and problems, particularly for the operational curricula.

2. In order to support the operational curricula (as well as the objective outlined in SECNAV 1524.2) NPS needs to provide for career paths that envision research in DoN operational and support applications as well as research in traditional academic disciplines. Any individual career path might well consist of a mixture of traditional and applications research which must often be classified.

3. If we are going to achieve the objective of a faculty at NPS that includes a substantial number of individuals active (or recently active) in classified research, then incentives for research in operational problems must be an integral part of the pay, promotion, and tenure system and the unique opportunity at NPS for such career path should be emphasized in faculty recruitment. A key problem is how we handle the results of research on classified problems. Because many of the operational problems are highly classified, it may not be possible to publish the results of research in those areas in traditional professional journals. However, career progression at NPS requires demonstrated research contributions. While maintaining academic standards, NPS needs to establish procedures to provide peer review of the work of faculty who choose to concentrate on these areas. Not all faculty will choose to utilize these procedures, but we must provide avenues for specialist development if we are to continue to offer operational programs.

4. Following is a suggested procedure for obtaining peer review of classified reports or papers. The basic objective is to get an affirmation of the professional quality of the work at the time it is completed, so that such reports can be considered equivalent to standard publications when considering policy, promotion or tenure actions.

a. The faculty member is responsible for developing a record of his research accomplishments in the operational field. Technical reports, classified or not, should be prepared in response to research assignments even when the report itself is not the product the research client desires.

b. Where the subject matter is appropriate, publication in the available classified journals is encouraged.

Journal of Defense Research

Journal of Underwater Acoustics

c. Where necessary NPS will obtain the advice and consent of the sponsor for the review of such reports by individuals with appropriate credentials and reputation either inside or outside of NPS.

d. The Department Chairman and the interested Academic Group Chairman will be responsible for the selection of one or more potential reviewers. The selection of a reviewer will be approved by the Department Chairman's dean. The first priority is for an outside reviewer. If outside review is not possible internal review can be considered. Although internal review poses more delicate problems in obtaining an objective review, the same procedure as for outside review should be followed.

D. A. SCHRADY